MARSHALL STAR

Marshall Space Flight Center **August 26, 1999**

"We bring people to space — We bring space to people"

Experimental X-34 rocket plane to begin testing

by Martin Burkey

NASA's experimental X-34 rocket plane will undergo testing in New Mexico, California and Florida under a test plan recently approved by Agency officials. Both schedule and cost implications are currently being evaluated.

To support the expanded flight test program, engineers from NASA's Dryden Flight Research Center, Edwards, Calif., and Orbital Sciences Corporation, Dulles, Va., will upgrade the first airframe, designated A-1A, for flight. Following a series of tow tests on the ground at Dryden, the A-1A will be used to conduct unpowered test flights from Orbital's L-1011 carrier aircraft at the Army's White Sands Missile Range, N.M.

At the same time, Orbital, NASA's contractor for X-34, will complete assembly of the second X-34, designated A-2. Its Fastrac rocket engine will be installed on the vehicle and test fired on the ground at Holloman Air Force Base, N.M., test facilities. After these ground test firings, the first series of powered flight tests of the X-34 will take place at Dryden.

The A-2 vehicle then will be shipped to Kennedy Space

*See **X-34** on page 3*

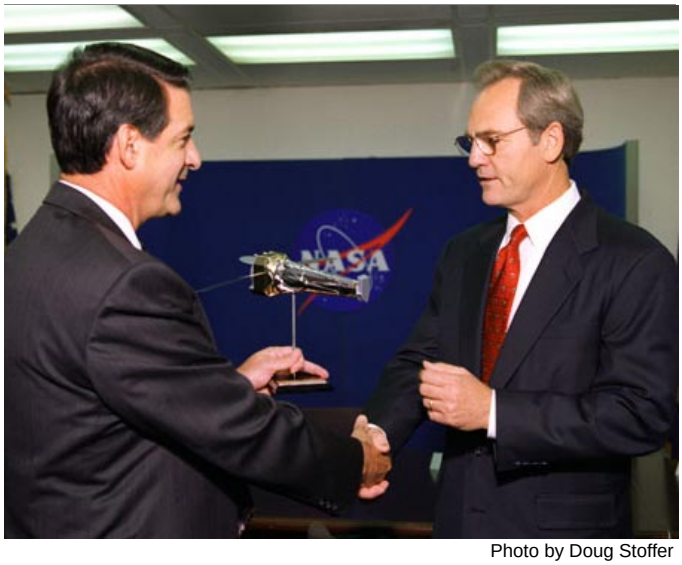

Photo by Doug Stoffer

National Space Science & Technology Center

Center Director Art Stephenson, left, greets Alabama Governer Don Siegelman during Siegelman's visit to the Marshall Center to endorse the new National Space Science and Technology Center. The core center, a unique joint venture to expand high-technology research, will be located in Huntsville.

Marshall scientist to see 22 years pay off with release of images from world's most powerful X-ray telescope

by Sherrie Super

When the first images from the world's most powerful X-ray telescope are released this week, no one awaits them with greater anticipation than the scientist who's spent 22 years helping make those images possible.

Dr. Martin Weisskopf of the Marshall Center is the project scientist for the Chandra X-ray Observatory. Responsible for the scientific integrity of the program, he's spent every day of his life for two decades "breathing it."

On joining the project in 1977, Weisskopf took out a piece of paper and wrote his estimate when the telescope would launch: the year 2000.

"I did not expect it to go fast," he says today. "We've actually exceeded my expectations." Chandra was launched in July.

Since committing his prediction to paper, Weisskopf saw his children grow up, watched them have children, and held on to that piece of paper.

"Right now we're smiling," he says as he anticipates the first Chandra images. "Things are going very well."

First images from Chandra to be unveiled Thursday

The first images from the Chandra X-ray Observatory will be unveiled Thursday at a press briefing at NASA Headquarters in Washington, D.C. The event will be carried live at noon on NASA Television and will include images of spectacular remnants of a supernova and other astronomical objects.

The son of two lawyers from Vienna, Weisskopf grew up on the South Side of Chicago and went to college to follow in his parents' professional footsteps. Soon, however, he discovered his love of physics over law.

That preference was fueled by a discovery he made researching a term paper on quantum mechanics. A favorite uncle, he learned, was a famous scientist — Victor Frederik Weisskopf, former Massachusetts Institute of Technology professor and director-general of the prestigious CERN European Laboratory

*See **Weisskopf** on page 4*

"Work Hard, Work Smart, Work Safe"
— Safety slogan submitted by
Barry Hale, SD74

NASA, Thiokol sign Shuttle rocket motor contract

by Martin Burkey

NASA and Thiokol Propulsion of Brigham City, UT, have completed negotiations for a contract worth up to $1.73 billion for 73 Space Shuttle Reusable Solid Rocket Motors. The motors — two are used per flight — are the primary component of the Shuttle Solid Rocket Boosters, providing 6.6 million pounds of thrust or 71.4 percent of what the Shuttle needs for liftoff.

"This purchase will support Shuttle launches for several more years," said Ben Goldberg, manager of the motor project at the Marshall Center. "This contract includes performance, as well as cost incentives for our industry partner. We're seeking ways to reduce cost while maintaining the important level of safety. Our overriding requirement in this program continues to be safety."

The contract calls for manufacture and delivery of the new motor components to

*See **Contract** on page 5*

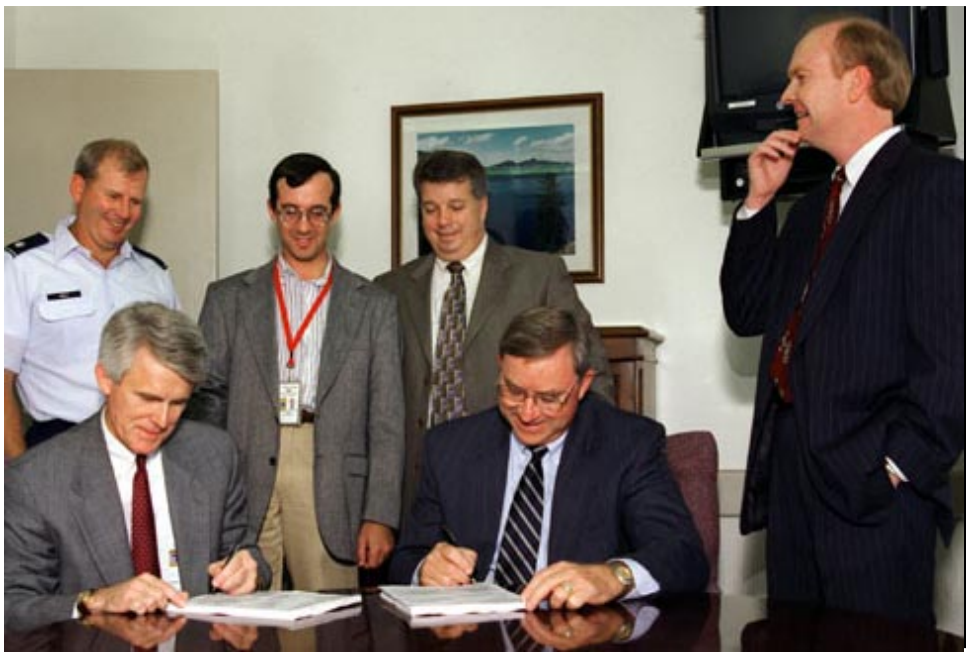

Photo by Doug Stoffer

Marshall Procurement Director Steve Beale, seated left, and Gerald Smith, vice president of Space Operations at Thiokol, complete negotiations by signing the contract. Standing from left are Lt. Col. Steve Bible of Thiokol, and Ben Goldberg, Marshalll's Reusable Solid Rocket Motor project manager; Emil Posey, manager of Marshall's Space Flight Project Support Department, and procurement analyst Steve Morris.

Marshall Values

Teamwork offers various representations of talents and skills

Editor's note: *This is the fourth in a five-part series addressing Marshall's core values.*

The Marshall team is committed to five core values: People, Customers, Excellence, Teamwork and Innovation. These values serve as the principles that guide our decisions and behaviors. This week the Star looks at the value of teamwork. Jim Kennedy, director of the Engineering Directorate, explains why teamwork is important.

TEAMWORK:

• We are a unified and interdependent team.

• We cooperate, communicate openly and share ideas with each other for the common good.

• We seek and enable partnerships with other NASA Centers, other agencies, academia, industry and our local and global communities.

No one person can singularly accomplish Marshall's mission — it takes everyone to get the job done. It takes a multitude of diverse talents and skills to accomplish our mission.

"For example, typically on a team, you will have customers and service providers," Kennedy said. Within those two major groupings is where we see the need for the various representation of talents and skills.

"We take great pride in our team being not only multi-disciplined, but that our teams also represent a cross section of our community with industry, civil service and academic employees," Kennedy added.

Kennedy said teamwork requires good leadership, as well.

"Teams include everyone. All team members are equal. However, someone has to pull it all together. One thing being stressed at this Center is the need for good, strong leadership. We all have a job to do. There is no one job that is more important than another. It takes everyone to accomplish the complex tasks we take on every day."

Teamwork is just a healthy, fun way to do business, Kennedy said. "Working together as a team is more enjoyable. "One of the nice features of teamwork to me is that it gives us a work family to lean upon. When things are going great, like right now with the Chandra X-ray Observatory, and you are experiencing the joy of success, you have team members who can enjoy that success with you.

"You also have that kind of support when things are not going so successfully. Your teammates can share that load as well."

Carter joins Marshall as Center Operations Deputy

James H. Carter has been named deputy director of the Center Operations Directorate at the Marshall Center.

The directorate is responsible for the institutional services of the Marshall Center, one of NASA's largest field installations.

James Carter

With more than 190 specialized employees, the directorate's services include environmental engineering, information systems, logistics, facility maintenance and operations, technical information and operations, protective services, occupational medicine and food services.

Carter brings to his new position more than 27 years of experience with the U.S. Army Corps of Engineers, where he was most recently chief of the Construction, Operations and Readiness Division in St. Louis, Mo. He directed a wide range of civil works projects, including the civil works construction program, and readiness and regulatory programs.

Space.com Photo by Doug Stoffer

Lou Dobbs, former CNN anchor and founder of Space.com, views a model of the X-34 with Center Director Art Stephenson during a recent visit to learn about Marshall Center programs. Space.com is a new Internet site to promote space and space related business.

1999 CFC Community Service Day coming Sept. 25

by Rachel Kamenetzky

Marshall Center civil service and on-site contractors are encouraged to participate in the Fourth Annual Community Service Day on Saturday, Sept. 25.

As part of the Combined Federal Campaign activities at the Center, Community Service Day provides an opportunity to donate time and special skills to participating community agencies in need of "hands on" donations.

Volunteers are provided with a personal view of the actual work involved in operating and supporting the services local agencies provide year round to needy individuals and families.

This year, projects are scheduled for Technology Assistance for Special Consumers, where toys will be adapted for children with physical challenges, Care Assurance for the Aging and

*See **Community Service** on page 7*

X-34

Continued from page 1

Center, for a second series of flight tests. These flights, which will reach speeds of up to approximately Mach 4.5, will demonstrate rapid turnaround flight operations. Demonstrations of autonomous crosswind landings and flight through rain will also be part of this testing.

Dryden and Orbital will complete the remainder of the test program, which involves the third X-34, designated A-3. These test flights will expand the rocketplane's maximum capability of speeds up to Mach 8 and altitudes up to 250,000 feet, while also testing additional reusable launch vehicle technologies as carry-on experiments.

The unpiloted, reusable X-34 is designed to demonstrate technologies and operations necessary to cut the cost of putting payloads into orbit from $10,000 to $1,000 per pound. Orbital has an $85.7 million contract with NASA to design, build and test fly three X-34 vehicles.

The winged, single-engine X-34 is 58.3 feet long. It has a 27.7-foot wingspan and stands 11.5 feet tall. It will be powered by a reusable Fastrac engine, designed and developed by engineers at Marshall and built by NASA's industry partners.

Marshall manages the X-34 program for NASA.

The X-34 is designed to be air-launched from beneath Orbital's modified L-1011 carrier plane and make an automated landing on a conventional runway and be readied for its next flight.

The writer, a contractor employed by ASRI, supports the Media Relations Department.

Center establishes building managers

Building managers have been designated for each of the 260 buildings at the Marshall Center and a list of the Building managers has been posted in the Safety Concerns Reporting System (SCRS).

These individuals will serve as the points of contact for issues concerning their buildings. Employees should continue to call 4-HELP (option 4 on the menu) to submit work requests for any work that needs to be done in the building. But the Building Manager will be available to help work any issues.

The building managers will assure safety issues regarding their buildings raised in the Safety Concerns Reporting System are dispositioned. In addition, they will monitor safety reports and findings for corrective actions.

Building managers will work with supervisors and others as necessary to assure all safety issues with the building and grounds are dispositioned, and that good housekeeping is practiced in and around their buildings.

Building mangers will also coordinate all building service outage requests in their building and will be the authority for issuing permits for heat producing appliances. They will support the Center's Emergency Management Program by assuring that training is provided to the individuals in their buildings who are assigned to support the residents if there is an emergency such as fire or tornado.

Building managers replace safety monitors

Safety monitors have been replaced by building managers and their assistants. All mangers and assistants should attend one of the following training sessions: 1-3 p.m., Aug. 26, Bldg. 4200, Room P110; 9-11 a.m., Sept. 7, Bldg. 4203, Room 1201; 1-3 p.m., Sept. 9, Bldg. 4203, Room 1201; 9-11 a.m., Sept. 14, Bldg. 4203, Room 1201; or 1-3 p.m., Sept. 16, Bldg. 4203, Room 1201.

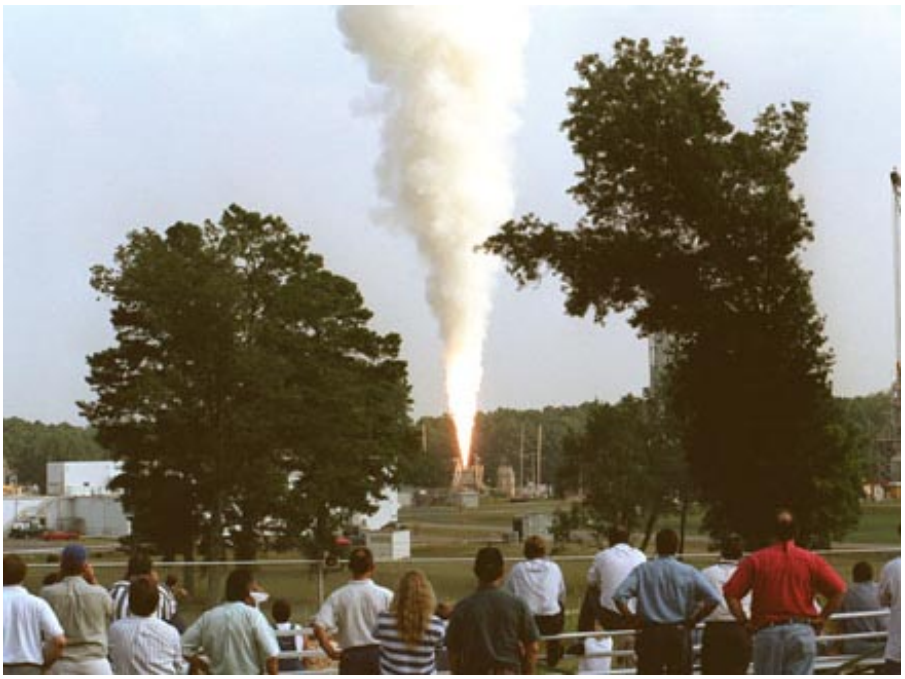

Photo by Dennis Olive

Successful firing of MNASA RSRM-10 motor

A successful firing of the MNASA Reusable Solid Rocket Motor (RSRM)-10 solid motor was conducted at Marshall on Aug. 10. The 48-inch diameter solid motor is used as a testbed to support the RSRM Program and uses Shuttle propellant. The motor was fired for 29 seconds and the post test quick-look revealed no apparent problems.

Weisskopf

Continued from page 1

for Particle Physics in Geneva, Switzerland.

"I've always wanted to be like my parents and my uncle and aunt," says Weisskopf. "They were of a different age. They were intellectuals, which I am not."

Martin Weisskopf found he was "really interested in astrophysics and pursuing new frontiers."

Today, 30 years after receiving a doctorate in physics from Brandeis University in Waltham, Mass., Weisskopf is on the verge of realizing the dream he's clung to for two-decades.

Images from the Chandra Observatory, Weisskopf believes, are vital to our understanding of the universe and basic physics. "In trying to understand the universe, we try to understand where and what the dark matter is," he said.

"And in that pursuit, we might discover some strange forms of matter that cause us to take a new look at our laws of basic physics.

"Moreover, the universe is a wonderful lab that allows us to test laws of physics that we can't test on Earth," said Weisskopf.

Thousands of people have helped make the first images possible, yet the work is far from over.

"Many additional people and future scientists will make unsuspecting discoveries, broaden our scientific knowledge of physics, and write wonderful papers on their findings — all as a result of Chandra," says Weisskopf.

Looking to the future, Weisskopf has added another piece of paper to his collection. It reads 2020 — his estimated launch date of the next project he hopes to tackle, another great observatory still in its infancy.

The writer, a contractor employed by ASRI, supports the Media Relations Department.

Marshall Center nearly ready for year 2000 tranistion

by Marianne Higgins

At the Marshall Center, computer experts have been busy preparing for the transition and are confident Marshall's systems will have no problems.

"As part of a federal agency, we had to develop and implement a plan by March of this year to fix the 'Y2K problem.' And we have done that," said Sheila Fogle, Y2K project manager for Marshall's Information Services Department. "Over 95 percent of our computer systems are compliant. By October, all will be."

Fogle leads the Information Services Department Y2K Team established in 1996 — the same year the federal government ordered all agencies to begin steps toward Y2K compliance.

To be compliant, computers must be upgraded or replaced, to ensure they correctly read a two-digit year code "00" as the Year 2000. Otherwise, there's a risk the date will be misread as 1900 and computers may malfunction or shut down.

"We only have a few desktop systems left to upgrade, a couple of systems to modify, and a couple of systems to retire, and we'll be ready," said Fogle.

"We view the Y2K issue as a business problem, not a computer problem," said Fogle. "If computers and communications equipment don't work, we can't do business, whether it is a NASA or contractor system, whether it is space-related software or a payroll system."

As confident as Marshall's Y2K Team is that the New Year will bring business as usual, computer support experts will be on duty and on call New Year's Eve as part of contingency planning.

"We'll establish a Y2K Control Center around 7 a.m. CST, Dec. 31, to begin monitoring what's happening in time zones east of us," said Fogle. "If we see a pattern of recurring problems in other parts of the world, we'll recheck our systems. We know there could be an outside influence, such as a power outage, and we plan to make sure we can handle whatever might come our way."

The writer, a contractor employed by ASRI, supports the Media Relations Department.

Contract

Continued from page 2

Kennedy Space Center, to begin this fall and continue through September 2004. Thiokol also will conduct post-flight review of the last motors flown, carrying the contract through 2005. In addition to 35 sets of flight motors, the contract also includes three motors that will be used in ground testing to ensure quality and prove new materials, manufacturing techniques and hardware suppliers.

The original solid fuel motor was redesigned in 1986. Each motor is about 126 feet long and 12 feet in diameter and contains 1.1 million pounds of propellant. The propellant is mixed and then cast in four hollow, cylindrical metal casings. When it solidifies, it has the color and consistency of a pencil eraser.

A forward dome containing the igniter and an aft dome with a steerable exhaust nozzle are attached. The motors burn for about 123 seconds before they burn out and are jettisoned to descend by parachute into the Atlantic Ocean.

During flight, each motor puts out the equivalent of about 15.4 million horsepower. The solid fuel motor's combustion gas temperature approaches 6,000 degrees Fahrenheit — nearly two-thirds the temperature of the Sun's surface. At that temperature, steel doesn't melt; it boils. After each flight, the segmented motors are recovered and disassembled. The cylindrical motor cases are cleaned, reinsulated and refilled with propellant. The exhaust nozzles are refurbished, and other components are replaced as needed. Nose cone and aft skirt assemblies are added to turn the motor into a completed booster.

With this new contract, NASA will have purchased 230 flight motors and 11 flight support motors to date. The Marshall Center manages the motor program.

The writer, a contractor emloyed byASRI, supports the Media Relations Department.

Job Opportunities

CPP 99-71-RE, Supv AST, Technical Management, GS-801-14/15, Space Transportation Directorate, X-33 Program Office. Closes Aug. 27.

Reassignment Bulletin 99-11-CP, AST, Technical Resources Management, GS-801-13, Science Directorate, Business Management Office. 1Closes Aug. 26.

CPP 99-99-JB, AST, Experimental Facilities Development, GS-801-14, Center Operations Directorate, Facilities Engineering Department, Design and Construction Group. Closes Aug. 27.

CPP 99-100-MB, AST, Data Systems, GS-854-15, Engineering Directorate, Avionics Department, Flight Software Group. Engineering Directorate, Avionics Department, Flight Software Group. Closes Sept. 1.

CPP 99-101-MB, AST, Theoretical Simulation Techniques, GS-861-14, Engineering Directorate, Avionics Department, Simulation Group. Closes Sept. 1.

CPP 99-103-CV, Management Support Assistant (OA), GS-303-7/8, Office of the Director. Closes Aug. 30.

CPP 99-105-RE, AST, Reliability & Quality Assurance, GS-861-14 (2 vacancies), Safety and Mission Assurance Office, Transportation Assurance Department. Closes Aug. 30.

CPP 99-106-RE, AST, Quality Assurance, GS-861-14, Safety & Mission Assurance Office, Safety, Reliability & Quality Assurance Department. Closes Aug. 30.

CPP 99-109-RE, Safety and Occupational Health Specialist, GS-018-7/9/11 (4 vacancies), Safety & Mission Assurance Office, Safety, Reliability & Quality Assurance Department. Closes Sept. 7.

CPP 99-110-RE, Quality Assurance Information Systems Analyst, GS-301-77/9/11, Safety & Mission Assurance Office, Safety, Reliability & Quality Assurance Department. Closes Sept. 7.

NASA takes delivery of 100th set of Shuttle solid rocket booster flight hardware

by Martin Burkey

NASA's Space Shuttle solid-rocket booster program has marked the flight of its 100th set of booster hardware with this year's flight of the STS-96 mission.

The mission flew with the 100th assembly built of reusable booster hardware. The 100th Shuttle mission won't lift off until next year. But when the Shuttle program needed a cylindrical forward skirt modified to carry video equipment for filming the external fuel tank during launch, the next available hardware was the left forward booster section refurbished for the 100th mission.

The Marshall Center manages Space Shuttle main propulsion, including the boosters, liquid fuel main engines, and external fuel tank.

The Shuttle's twin solid-rocket boosters are responsible for nearly three-quarters of the liftoff thrust during every Shuttle mission. Although the 3.3 million pounds of thrust in each booster's reusable solid-rocket motor provides the muscle, it's the other hardware that keeps it in check. The booster hardware at the front and back of each motor controls motor ignition, steers the rocket exhaust, jettisons the boosters free of the climbing shuttle, and carefully times the deployment of parachutes. The parachutes lower the reusable boosters to the ocean.

The 100th build hardware on STS-96 included the booster forward section and nose cone, which contains guidance and control computers, self-destruct electronics, parachutes and radar tracking beacons. On the two most recent Shuttle flights, forward sections have contained video cameras used to film the Shuttle external fuel tank during ascent.

The 100th build hardware also contained 1,500 small flags that were recovered and presented to booster workers with USBI Co. in Florida to commemorate that milestone and the transfer later this year of booster operations at Kennedy Space Center in Florida from USBI to United Space Alliance.

The Shuttle boosters — the first designed to be reused — are the largest solid propellant rockets flown on a piloted spacecraft and the largest objects

*See **Booster** on page 7*

NASA artwork on display in 4203 cafeteria until Sept.10

by Rosa Kilpatrick

Employees and contractors are invited to view 19 pieces of art on loan from Kennedy Space Center's NASA art program. The pieces are original art pieces and will be in the 4203 cafeteria until Sept.10.

Additionally, the EarlyWorks Museum is housing an additional 21 pieces of this exhibit through Sept. 15 at no charge to the general public.

For more than 30 years, the NASA Art Program has documented America's major accomplishments in aeronautics and space. During that time, more than 200 artists have generously contributed their time and talent to record their impressions of the U.S. aerospace program in paintings, drawings and other media

Not only do these art works provide a historic record of NASA projects, they give the public a new and fuller understanding of the advancement in aerospace.

NASA's art collection includes works by Robert McCall, Andy Warhol, Robert Rauschberg and Jamie Wyeth. The work depicts a wide range of subjects, from Shuttle launches to aeronautics research, Hubble Space Telescope and even vital reality.

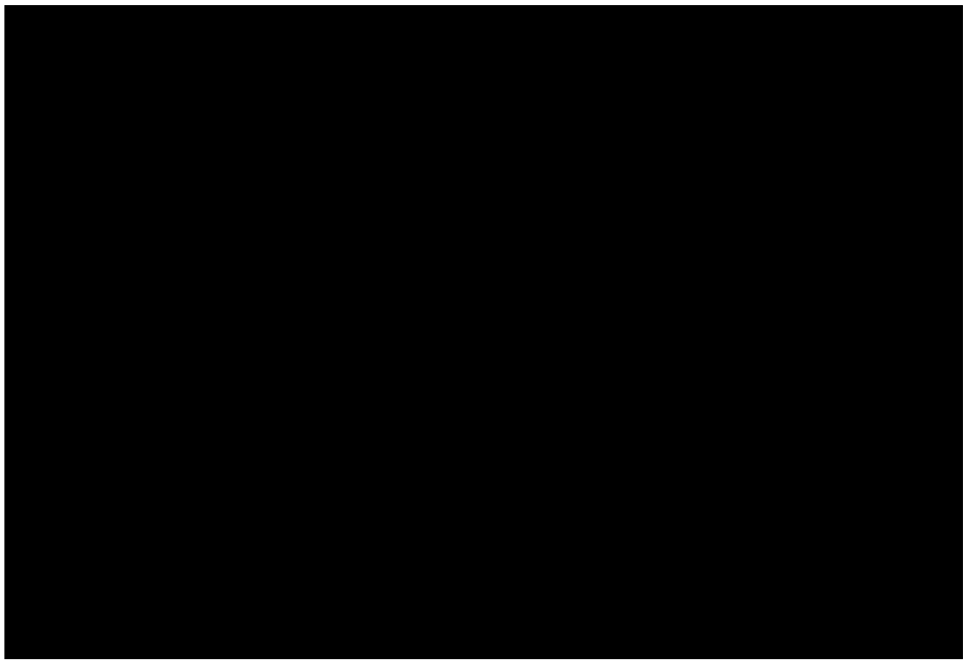

Photo by Dennis Olive

Uncrating NASA artwork to be displayed in the cafeteria of Bldg. 4203 are from left, Talmage Reynolds, Chip Dobbs and Melvin Scruggs of the Center Operations Directorate.

The writer works in the Government and Community Relations Department.

Upcoming Events

TFAWS '99 Workshop — The Tenth Thermal & Fluids Analysis Workshop (TFAWS '99) will be held Sept. 13-17 at the Bevill Center in Huntsville. Marshall is hosting the event. The workshop will focus on applications of thermal and fluids analysis in the aerospace field. The workshop will bring industry, academia and government together to share information and exchange ideas about applications analysis tools and methods. To register, visit the Web at: http://tfaws99.msfc.nasa.gov

Shuttle Replacement Technology Team Meeting — The Shuttle Replacement Technology Team will meet Sept. 1-2 from 8 a.m.-5 p.m. at Bldg. 4203, room 1201. The meeting will provide Shuttle elements, equipment manufacturers and NASA personnel an opportunity to present and discuss measures being taken in eliminating ozone depleting chemicals and hazardous air pollutants. Elements to be discussed include the external tank, orbiter, reusable solid rocket motors, solid rocket booster and Space Shuttle main engine. Equipment to be discussed includes extra-vehicular equipment activities such as space suits, maneuvering units, etc. Changes to Environmental Protection Agency regulations affecting these items also will be discussed. Anyone interested in the topics to be presented and discussed may attend. For more information, call Vaughn Yost at 544-1998 or e-mail at vaughn.yost@msfc.nasa.gov

Community Service

Continued from page 3

Homebound (CASA), where volunteers will build wheelchair ramps and do general home repairs for elderly persons, and Christmas Charities, where volunteers will repair toys and outfit children with clothing.

In addition, the project for Habitat for Humanity will provide finishing touches to homes, and the Salvation Army will provide an opportunity for volunteers to serve a lunchtime meal.

To volunteer for any of these projects, contact Rachel Kamenetzky, Community Service Day executive vice chairperson, at 544-1089.

The writer is employed in the Engineering Directorate.

Marshall Center
Safety Awareness Day
Kickoff
Oct. 20, 8:30 a.m.
Morris Auditorium

Booster

Continued from page 6

three-times over ever to be recovered by parachute. Their combined thrust is equivalent to 44 million horsepower — 14,700 six-axle diesel locomotives or 400,000 subcompact cars. At liftoff, the two boosters consume 11,000 pounds of fuel per second — 2 million times the rate at which fuel is burned by the average family car.

The boosters are ignited after the three Shuttle main engines' thrust level is verified and they continue firing for the first two minutes of the ascent. They separate from the Shuttle at 150,000 feet altitude and continue climbing to nearly 230,00 feet — about 41 miles — before beginning a long tumble toward the Atlantic Ocean.

Controlling a rocket only 2 feet shorter than the Statue of Liberty and weighing three times as much requires some ingenious engineering and powerful pyrotechnics, said John Chapman, booster chief engineer for the Marshall Center.

"The booster exhaust nozzle is steered by two smaller rocket-powered pumps no bigger than a shoebox, but they produce the same horsepower as the average American automobile engine through a shaft that spins 10 times faster than the engine in a Winston Cup stock car," Chapman said.

A total of eight solid propellant rockets shove each booster away from the Shuttle, Chapman added. A set of explosives pops off open the nose cap to pull out a 12-foot-diameter pilot chute, followed by a 54-foot-diameter drogue chute. A ring of explosives cuts open the nose cone to deploy three 136-foot-diameter main chutes — all opened gradually by a series of small grenade-sized pyrotechnic devices. If they opened all at once, the air at eight-tenths the speed of sound would rip them apart, Chapman explained. If the boosters go off course during ascent, U.S. Air Force range safety officials can ignite explosives equivalent to 16 pounds of TNT to split open the cases lengthwise and destroy them.

The booster hits the ocean at 60 mph. It's designed to hit tail first so that air compressed inside the booster by ocean water will pop it back up to the surface. Recovery ships return the boosters for refurbishment and reuse.

"What goes up costs $70 million. What we recover is still worth $40 million," Chapman said. "The solid rocket booster hardware is what makes that investment recoverable and reusable."

The writer, a contractor employed by ASRI, supports the Media Relations Department.

Obituary

Billmayer, Hans, 87, Huntsville, died July 24. He retired from Marshall in 1972 where he worked as a structural mechanic. He is survived by his wife, Hedwig Billmayer.

Hester, Charles, 66, Huntsville, died Aug. 16. He retired from Marshall in 1995 where he worked in the Personnel Services Division. He is survived by his wife Patricia Hester.

Employee Ads

Miscellaneous

★ Coffee table and two end tables, black lacquer finish, $50 for all. 881-3527 after 3:30p.m.
★ Garage door, 1 piece, 9x7, painted, complete springs and rails, $35. 881-1305
★ Cherry dining room table, chairs; Formica kitchen table, chairs. 379-2822
★ Biggest Big Bertha driver, 10 degree loft, Pro-lite shaft, $270. 851-7406
★ Wood bunk beds w/twin mattresses $100; wood display case, $100; men's suits, $25-$50. 883-2125
★ Playskool high chair, $25; changing table, $50; Evenflo infant carseat, navy/white, $25. 895-0148
★ Vacation time-share package, domestic and international with deed at new Pidgeon Forge Fairfield Resort. 880-9025
★ Murray riding lawn mower, 12hp, 38" cut, $350 obo. 828-6213
★ Camper shell for full size short bed truck, $75; ab and back exerciser, $50. 852-3501
★ 1971 boat, 16' Tri-Hull run-about w/trailer, 65hp, Johnson motor, $600. 851-9982
★ Kathy Ireland reclining exercise bike, $50. Harry/722-9483
★ Fisher Price power wheels with battery and charger, $65. 890-0768
★ Toro riding mower, 32" cut, good condition, $450. 837-0085
★ Saint Bernard puppies, AKC, mother and father on premises, have shots, $350. 796-8496
★ Mitsubishi model VS-405R 45" rear projection TV with service and user manuals, $525. 881-1186
★ Riding lawn mower, electric start, 36" cut, 11hp engine, $130. 895-9856
★ GE washer and dryer, $185 for set; Kenmore appliances, black, dishwasher, $85, wall oven, $95. 859-2959
★ 1998 Kawasaki Vulcan 800 motorcycle, 3K miles, windshield, bags, two backrests, warranty, $5,200. 837-6109
★ 55-gallon Odell aquarium w/matching bleached solid oak cabinet and accessories, $300. 350-1292
★ Shopsmith Mark V, original owner, all standard attachments, manuals & 6" belt sander attachment w/belts, $1,075. 881-1607
★ 1997 Harley Davidson, FXSTC custom, 3.5 miles, garage kept, show quality bike, black/silver, $27,500. 350-1292 after 5:30PM
★ Schwinn 10-speed racing bicycle and Raleigh super course racing bike, $150 ea.; Schwinn 24" girl's bike, $50. 539-0263
★ Lazy Boy sectional sleeper sofa w/recliner on one end, blue, $500. 837-6838
★ Full-queen adjustable headboard, night stands, mirrored dresser, armoire, black lacquer, good condition, $250. 881-3800
★ Auburn vs. Appalachian State, Idaho, Central Florida, $25 for each pair. 722-9114
★ Lowe boat, 16 ft. 40 hp Suzuki trolling motor, fishfinder, new battery cover carpet trailer, $3,200 obo. 881-6143
★ King-size waterbed, $50; desk, $25; used golf clubs w/bag, $15. 830-4191

Vehicles

★ 1994 Nissan, Sentra XE, 4-door sedan, 90K miles, white, 4-cylinder auto., A/C, AM/FM cassette, $4,500. 772-9930
★ 1990 Dodge Dakota Sport, 150K miles, A/C, auto, cruise, cassette, camper, all maintenance current, $4,400 obo. 837-6109
★ 1998 White Sebring LXI, PW/PL, leather, keyless entry, security system, sunroof, 35K miles, $17,900. 728-5679
★ 1997 Mustang, V6, red, 29K miles, factory warranty, keyless entry, A/C, $12,700. 498-6568
★ 1986 Toyota pickup, 4WD, SR5 X-cab, 5-speed, 73K miles, $4,500 obo. 232-1940
★ 1990 Volvo, Model 760 turbo, 140K miles. 534-2025
★ 1996 Saturn SL12, loaded, one owner, 4D, auto, red, alloy wheels, 41,500 miles, $10,995. 837-1992
★ 1991 Lincoln Continental, Signature series, light blue, leather interior, one owner, excellent condition. 837-1259/830-4711
★ 1992 Mazda Navajo, 2-door, power windows/locks, sunroof, automatic, 65K miles, $7,700. 482-2901

Free

★ Lab/chow mix, 8 months old, all shots, neutered, good with children. 883-6496

Wanted

★ Exercise treadmill, working or not. 351-1204
★ Electric dehumidifier, 25-50 pint capacity; electric floor buffer/polisher, in good working order. 464-5819

Carpool

★ Ride from between Martin and Airport Road to or from Bldg. 4481. Call Craig Moore/544-7585

Center Announcements

☛ ***MARS Ballroom Dance Club*** — The MARS Ballroom Dance Club will offer tango and waltz lessons on Sept. 13, 20, 27 and Oct. 4 at St. Stephen's Episcopal Church. Intermediate classes will start at 7 p.m. and beginner classes at 8. The lessons are available to the public for $4 per person per night. Call Linda Kinney at 4-0563.

☛ ***MARS Fishing Club*** — Results of the Wheeler Lake/First Creek tournament are: First place —Don McQueen and Deon Smith with fish weighing 7.74 lbs; second place — Dale Hedden and Brian Mitchell with fish weighing 5.41 lbs; and third place — Rob Butler and Rob Hilley with fish weighing 4.53 lbs. Big fish honors went to Deon Smith with a 1.87 pound bass. The next tournament is scheduled for Sept. 18th at Guntersville Lake/Browns Creek Ramp. Contact: Charles Kilgore, 4-9437; Don McQueen, 4-9073 or Charlie Nola, 4-6367.

☛ ***Lunar Nooners Toastmasters —*** The NASA Lunar Nooners Toastmasters Club meets Tuesday at 11:30 a.m. in Bldg. 4610 cafeteria conference room. All Marshall employees, contractors and friends are invited to attend. Call Lee Johns at 4-5142.

☛ ***Public Surplus Auctio***n— Marshall, Boeing, Teledyne-Brown and others public surplus auction is scheduled for 9 a.m., Aug. 28 at Bentley's & Associates, 1025 Jordan Road. Viewing and inspection times are Thursday, noon -5 p.m.; Friday, 8 a.m. -5 p.m.; and Saturday, 7:30-9 a.m.

MARSHALL STAR
Vol. 39/No. 50

Marshall Space Flight Center, Alabama 35812
(256) 544-0030
http://www.msfc.nasa.gov

The Marshall Star is published every Thursday by the Internal Relations and Communications Department at the George C. Marshall Space Flight Center, National Aeronautics and Space Administration. Contributions should be submitted no later than Monday noon to the Marshall Internal Relations and Communications Department (CD40), Bldg. 4200, room 101. Submissions should be written legibly and include the originator's name. Send electronic mail submissions to: intercom@msfc.nasa.gov The Marshall Star does not publish commercial advertising of any kind.

Director of Internal Relations
and Communications — Norman Brown
Editor — Debra Valine

U.S. Government Printing Office 1999-733-111-80075

BULK RATE
Postage & Fees PAID
NASA
Permit No. G-27